

ABSTRACT

A spatial light modulator is disclosed, along with a method for making such a modulator that comprises an array of micromirror devices. The center-to-center distance and the gap between adjacent micromirror devices are determined corresponding to the light source being used so as to optimize optical efficiency and performance quality. The micromirror device comprises a hinge support formed on a substrate and a hinge that is held by the hinge support. A mirror plate is connected to the hinge via a contact, and the distance between the mirror plate and the hinge is determined according to desired maximum rotation angle of the mirror plate, the optimum gap and pitch between the adjacent micromirrors. In a method of fabricating such spatial light modulator, one sacrificial layer is deposited on a substrate followed by forming the mirror plates, and another sacrificial layer is deposited on the mirror plates followed by forming the hinge supports. The two sacrificial layers are removed via the small gap between adjacent mirror devices with spontaneous vapor phase chemical etchant. Also disclosed is a projection system that comprises such a spatial light modulator, as well as a light source, condensing optics, wherein light from the light source is focused onto the array of micromirrors, projection optics for projecting light selectively reflected from the array of micromirrors onto a target, and a controller for selectively actuating the micromirrors in the array.